

ML

Notice of Allowability	Application No.	Applicant(s)	
	10/001,557	LOJEK ET AL.	
	Examiner	Art Unit	
	Ida M Soward	2822	

-- **The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**
 All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the Applicants' amendment filed December 29, 2003.
2. ☒ The allowed claim(s) is/are 3-7 and 9.
3. ☒ The drawings filed on 10-24-01 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____ |


AMIR ZARABIAN
ASSISTANT PATENT EXAMINER
BIOLOGY CENTER 2800

DETAILED ACTION

This Office Action is in response to the Applicants' amendment filed December 29, 2003.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Thomas Schneck on April 28, 2004.

The application has been amended as follows: "**comprising**" has been changed to **including** in line 4 of the abstract.

Claim 1. Cancelled

Claim 2. Cancelled

Claim 3. The non-volatile memory cell of claim 4 9 wherein said ~~small-spacer~~ resides connection conductive layer extends along a said opposite side of said small sidewall spacer and on top of said main floating gate region.

Claim 4. The non-volatile memory cell of claim 3 9 wherein said first insulating portion is over the drain.

Art Unit: 2822

Claim 6. The non-volatile memory cell of claim 4 9 wherein said ~~small sidewall spacer resides~~ connection conductive layer extends along a side ~~and on top~~ of said main floating gate region, said thin tunnel oxide having a portion covering the main floating gate region except for an opening therein, with the connecting conductive layer making contact with the main floating gate region through said opening.

Claim 7. The non-volatile memory cell of claim 4 4 wherein said first insulating portion ~~is over said drain~~ extends across the memory cell.

Claim 8. Cancelled

Claim 9. (Newly Added) A non-volatile memory cell comprising:

a semiconductor substrate, with a drain and a source in said substrate;

a conductive floating gate formed on said substrate between said source and drain with a first insulating layer separating said floating gate from said substrate, said floating gate including a main floating gate region and a small sidewall spacer, said first insulating layer including a first insulating portion separating said small sidewall spacer from said substrate and from said main floating gate region, a second insulating portion separating said main floating gate region from said substrate, wherein said first insulating portion is a thin tunnel oxide that is thinner than said second insulating portion, said small sidewall spacer having a first vertical side contacting said thin tunnel oxide and an opposite side that is electrically coupled to said main floating gate region by a conductive connecting layer extending over said opposite side of said sidewall spacer and extending past said thin tunnel oxide to contact said main floating gate region;

a control gate formed over said floating gate; and a second insulating layer separating said control gate and said floating gate.

Allowable Subject Matter

Claims 3-9 are allowed.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of the art with respect to non-volatile memory cell structures:

Hsieh et al. (US 6,229,176 B1)

Lee (6,159,797)

Lim et al. (6,124,170)

Mehta et al. (6,060,766).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ida M Soward whose telephone number is 571-272-1845. The examiner can normally be reached on Monday - Thursday, 6:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 571-272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2822

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

IMS

April 28, 2004


AMIR ZARABIAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800